# Report for 2004IL56G: Development of Water Use Benchmarks for Thermoelectric Power Generation in the United States

There are no reported publications resulting from this project.

Report Follows

## A. Problem and Research Objectives

This progress report summarizes the work that has been performed toward the completion of the "Development of Water Use Benchmarks for Thermoelectric Power Generation in the United States" (Grant No. 04HQGR0148, Letter Sub-award No. 2005-509-1-00) during the period from July 1, 2004 to April 30, 2005.

This research project aims at providing a basis for understanding water use in thermoelectric generation by developing indicators of water usage in electric power plants using different types of generation and different cooling systems. The main focus of this project is the development of average rates of water use both as withdrawals and consumptive use per unit of generated energy, as well as unit usage rates that represent the available levels of efficiency in water use (i.e., efficiency-in-use benchmarks). The following sections briefly summarize progress in specific areas of the project.

## B. Methodology and Principle Findings and Significance

The work on this project is follows the originally submitted work tasks. The status of work on each tasks is given below.

***Task 1. Review of Past Studies of Thermoelectric Water Use***

The literature related to thermoelectric water use has been reviewed. The review included both published and unpublished sources, including information available from consultants, regulatory agencies, and water utilities. A bibliographic list of available studies has been compiled.

***Task 2. QA/QC Review of EIA 767 Data Set; Develop Cooling System Level database for most recent year***

The data tables in the EIA-767 data sets at the multi-scale plant level have been organized by the cooling system. The data base used in the analysis represents EIA-767 reporting years from 1996 to 2003. Currently the data set is being finalized by conducting the final phase of QA/QC.

***Task 3. Develop Water-use Indicators for Individual Power Plants***

A preliminary analyses of the data set have been performed using the stochastic frontier analysis approach. The estimation was done using Frontier Version 4.1. Further estimations will be conducted once the data base if finalized.

***Task 4. Verify Water-use Indicators through Mail Survey of Power Plants***

A draft mail survey questionnaire has been developed. It was preceded by five on-site visits of thermoelectric power plants in Illinois, Kentucky and Missouri to identify the critical operational issues in controlling water use at the plants. The draft survey is now being sent to the facility engineers at the site-visit plants for testing and to verify that the data used in determining the indicators are correct. The survey will also solicit additional information about the specific design and operational features that affect water usage rates for cooling and other purposes at each facility.

***Task 5. Develop Final Benchmarks and Benchmarking Models***

This task is yet to be completed.

***Task 6. Project Reports and Web Site***

This task is yet to be completed.

## E. Tasks for the Next Eight Months

During the next three months, the research team aims to complete the following items:

1. Finalize master data set.
2. Re-estimate final stochastic frontier models.
3. Field the survey of power plants.
4. Prepare project completion (technical) report
5. Set up a web site and post data and publications
6. Finalize journal manuscripts